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Immunotherapy as a Treatment for Allergic Respiratory Disease in Horses

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Immunotherapy as a treatment for allergic respiratory disease in horses

Dust and molds are found everywhere, so it is not surprising that these substances rank high on the allergen list for horses. They usually don't cause hives or itches as they do in dogs. In horses, dust, mold and other substances affect the respiratory system, and serious pulmonary disease can result if the allergic condition is left untreated. Allergies can seriously interfere with performance, and drug treatment is often difficult. Veterinarians at New Bolton Center have treated allergic horses for a number of years with immunotherapy with good success.

"It is suspected that allergies are the major causes of chronic obstructive pulmonary disease (COPD) or chronic bronchiolitis and chronic coughing in horses," said Dr. Jill Beech, associate professor of medicine at the School of Veterinary Medicine, University of Pennsylvania. "It is also suspected that horses with exercise-induced, pulmonary hemorrhage and exercise intolerance at high speeds may have an allergic component to their disorder."

Dr. Beech and her colleagues see many horses with suspected allergies at the George D. Widener Hospital at New Bolton Center. "Often the first symptoms are a decreased exercise tolerance, and in race horses, slower times during high speed training sessions," she said. "Other signs include a cough or wheezing and an increased effort in breathing."

In many horses there is an inflammation of the lungs present. "When the animal is presented, a thorough physical exam is performed and a history taken. This often provides the first clue that we may be dealing with an allergy. An endoscopic exam is performed and transtracheal washes are done to obtain cell samples from the lower airways. Sometimes blood tests are done to rule out other disease." Dr. Beech explained that the extent of pulmonary dysfunction in horses is difficult to predict. "You can't do pulmonary function tests on these animals as you would do for humans, as testing involves patient cooperation and toleration of wearing and breathing into a mask with special equipment. Unless horses have been trained to tolerate testing, measurements are unlikely to yield meaningful information. Many of the tests which are used in humans, and would be most useful to us, require that the patient breathe in certain patterns requested by the examiner, and of course that is impossible in equine patients." If the horse bas respiratory problems only when running at high speeds, it may be normal while at rest. Ideally, lung function in these animals should be examined during exercise, but with the exception of a very few specialized research laboratories with treadmills and specialized equipment this is not possible.

The cell types found in the transtracheal washes in most cases provide a clue implicating an allergy. Allergy skin testing is the next step. Although the value of skin testing is somewhat controversial, at the present time it seems to be the best clinically applicable test for allergies. "We perform intradermal skin testing using 34 different allergens, mainly molds which are commonly found in barns but also including barn dust, hay and straw, some feedstuffs and saline and histamine as the negative and positive controls, respectively," she explained. "Reactions are evaluated for size, firmness and thickness at ½, 3 to 4 and 24 hours." Once it has been determined which compounds the horse is allergic to, an allergic extract for immunotherapy is prepared. "We prefer that the horse does not reach a very large number of antigens because that makes selection of antigens to be used more difficult; you either have to delete some from the mixture or give smaller amounts of each."

Allergy skin testing.

Skin test reaction.

Treatment by immunotherapy is relatively simple. An allergic extract is prepared from the antigens that elicited a strong response. The treatment consists of weekly subcutaneous injections of increasing doses until the volume of 5cc is reached; this often is given for six months and sometimes longer.

A retrospective study by Dr. Beech and Geralyn Schad Merryman on 116 horses treated with immunotherapy showed that immunotherapy is an effective and safe treatment for horses with allergic respiratory disease. The researchers found that 68% of the horses had a positive response. They found that the success rate tended to be higher in horses aged two to four years and more than 10 year old. They also found that Thoroughbreds had significantly more positive results than Standardbreds and Crossbreds and fewer positive results than Appaloosa and other breeds. "Thoroughbreds and Standardbreds spend a lot more time indoors. They are exposed continually to barn dust, mold and dust from bedding," she said. "It is very important that barns be well ventilated and kept as dust and mold-free as possible. Horses should be removed from the barn while it is cleaned to keep exposure to dust to a minimum."

If a horse is allergic, the resultant pulmonary disease can progress rapidly. "We have very few drugs we can use for treatment because of the racing regulations. Also, when drugs are used the frequency of medication is very important and some "treatment failures" may be because people don't follow the schedule. Immunotherapy provides a simple and permissible treatment."

Dr. Beech emphasized that management of the horses plays an important role in minimizing the exposure to allergens. Ventilation and a relatively dust-free environment should be provided. Additionally, bedding material can be changed to woodshavings (if non-dusty) and hay can be fed cubed, along with pelleted food, to prevent dust. Wetting feed may help. The usefulness of specially cured hays (e.g. Horse Haye) has yet to be fully evaluated.

She stressed that early treatment is important. "If the allergic response is severe, the animal can develop a chronic bronchitis. It may stop eating and can develop a secondary bacterial bronchitis; breathing will become more difficult. If that continues too long, in the very severe case heart problems can actually develop."

The testing for allergies can be performed by veterinarians in the field. "We have a kit available which we send out upon request," she said. "And if the veterinarian wishes to pursue treatment and considers the horse to be a good candidate, we prepare the antigen solutions for immunotherapy." More than 300 horses have been treated at New Bolton Center by immunotherapy. "It is not known exactly how immunotherapy works," Dr. Beech said. "More research needs to be done. Also, at this point, we have no way to accurately and easily measure the antibody levels to allergens in horses. If such tests were available, we could ascertain whether immunotherapy is affecting them. There is a need for basic immunologic investigations to better understand the immunologic mechanism in the horse."

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